

Spot Safety Project Evaluation

Project Log # 200512217

Spot Safety Project # 09-96-217

Spot Safety Project Evaluation of the Installation of a Left Turn Lane on NC 8/NC 65 at SR 1955 (Friendship Rd) Stokes County

Documents Prepared By:

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Traffic Safety Systems Management Section
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Principal Investigator

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6/16/2006
Date

Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 09-96-217 – NC 8/NC 65 and SR 1955 (Friendship Rd) in Stokes County.

Project Information and Background from the Project File Folder

The spot safety project improvement countermeasure chosen for the subject location was the installation of a eastbound left turn lane on NC 8/65 at SR 1955 (Friendship Rd). NC 8/65 is a two-lane facility at the subject location with a speed limit of 35 mph.

The initial statement of problem was that Rear-End crashes were occurring due to a high volume of through traffic and left turning traffic from a single approach lane on NC 8/65 with a high volume of opposing traffic. The subject location is a three-leg intersection which is controlled by a stop sign on SR 1955 (Friendship Rd).

The initial crash analysis was conducted from January 1, 1992 to July 1, 1996, which included 17 crashes; 10 Rear-End crashes, 1 Left Turn-Same Roadway crashes, 3 Angle crashes, and 3 Ran-Off-Roadway crashes.

The final completion date for the improvement at the subject intersection was on November 4, 1998 with a total cost of \$50,000.00.

Naive Before and After Analysis

After reviewing the spot safety project file folder along with all the crashes at the subject location, the crash data omitted from this analysis to consider for an adequate construction period was from September 1, 1998 through January 31, 1999. The before period consisted of reported crashes from October 1, 1991 through August 31, 1998 (6 years, 11 months) and the after period consisted of reported crashes from February 1, 1999 through December 31, 2005 (6 years, 11 months). The ending date for this analysis was determined by the available crash data at the time the crash analysis was completed.

The treatment data consisted of all crashes on a strip of NC 8/65 from 150 feet east of the turn lane taper (MP .411) to 150 feet west of the left turn lane and turn lane taper (MP .241). *Please see attached location map and photos for further details.*

The following data table depicts the Naive Before and After Analysis for the treatment location. Please note that Rear-End Crashes and Left Turn–Same Roadway Crashes related to SR 1955 were the target crashes for the applied countermeasure.

Treatment Information			
	Before	After	Percent Reduction (-) Percent Increase (+)
Total crashes	24	12	-50.0
Total Severity Index	7.55	5.32	-29.5
Target Crashes	9	0	-100.0
Target Crashes Severity Index	13.53	0	-100.0
Volume	10,200	11,000	7.8

Injury Summary		
	Before	After
Fatal Injuries	0	0
Class A Injuries	1	0
Class B Injuries	9	4
Class C Injuries	17	9
Total Injuries	27	13

The naive before and after analysis at the treatment location resulted in a 50 percent decrease in Total Crashes, a 100 percent decrease in Target Crashes, and an 8 percent increase in Average Daily Traffic (ADT). The before period ADT year was 1995 and the after period ADT year was 2002.

Results and Discussion

The naive before and after analysis involving the comparison of treatment actual before data versus treatment actual after data resulted in a 50 percent decrease in Total Crashes, a 30 percent decrease in the Severity Index, and a 100 percent decrease in Target Crashes. The summary results above demonstrate that the treatment location appears to have had a decrease in both Total Crashes and Target Crashes from the before to the after period.

Referencing the *Collision Diagrams* and the above table, it is apparent that the installation of the left turn lane on NC 8/65 significantly reduced Rear-End crashes involving eastbound vehicles waiting to turn onto SR 1955 (Friendship Rd). In the before period there were seven (7) Rear-End related to left-turning traffic and one (1) Ran-Off-Roadway crash involving a driver attempting to avoid a stopped vehicle at the intersection. In the after period this pattern has disappeared. There were two (2) rear end crashes on NC 8/65 at the intersection, but they both involved a driver suddenly stopping for either a pedestrian or animals and were unrelated to a left-turning vehicle. Left Turn-Same Roadway crashes also were reduced, from 1 to 0, from the before to the after period.

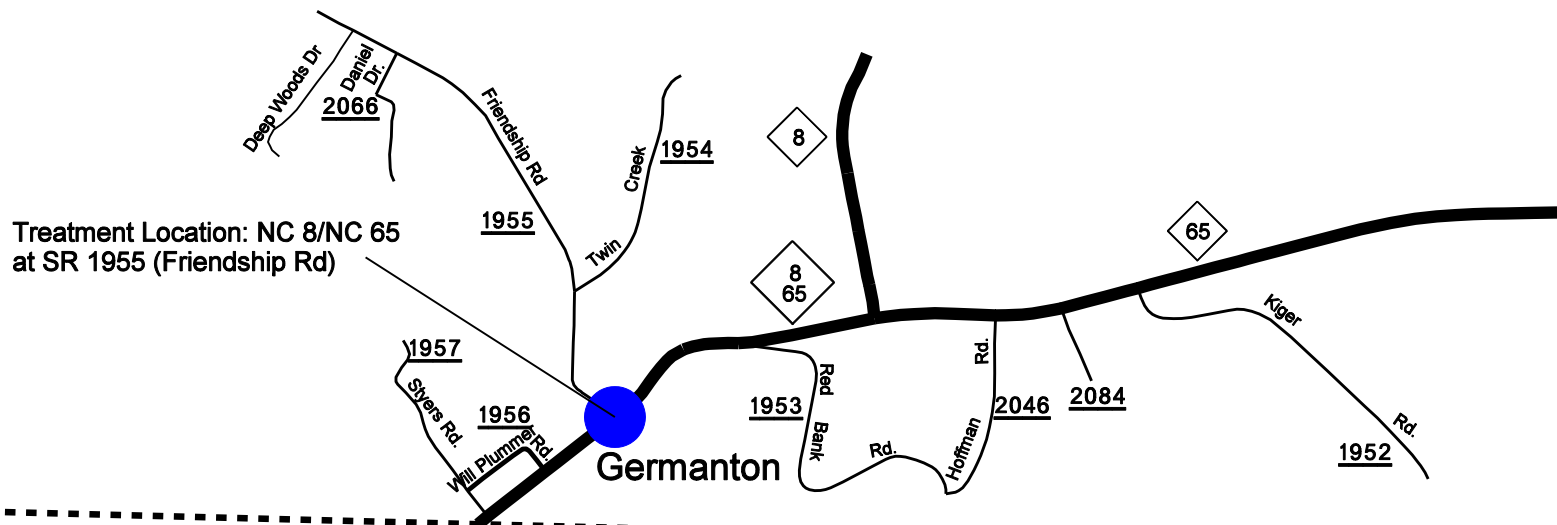
Again Referencing the *Collision Diagrams-Before Period*, a pattern of Rear-End crashes can be seen just east of the intersection involving vehicles on NC 8/65 waiting to turn left into the Citgo gas station on the corner of NC 8/65 and SR 1955 (Friendship Rd). This pattern reduced 80 percent

(from 5 to 1) from the before to the after period. It is assumed this reduction can be attributed to left-turning vehicles using the painted island just opposite the turn lane as a refuge.

Please see the attached *Treatment Site Photos*. Photos are provided all three approaches to the subject location.

As the Safety Evaluation Group completes additional spot safety reviews for this type of countermeasure, we will be able to provide objective and definite information regarding actual crash reduction factors for this type of intersection.

Location Map Stokes County Safety Evaluation of Spot Safety Project 09-96-217



Forsyth County Line

TREATMENT SITE PHOTO TAKEN 5/2/2006



Traveling East on NC 8/ NC 65



Traveling West on NC 8/NC 65



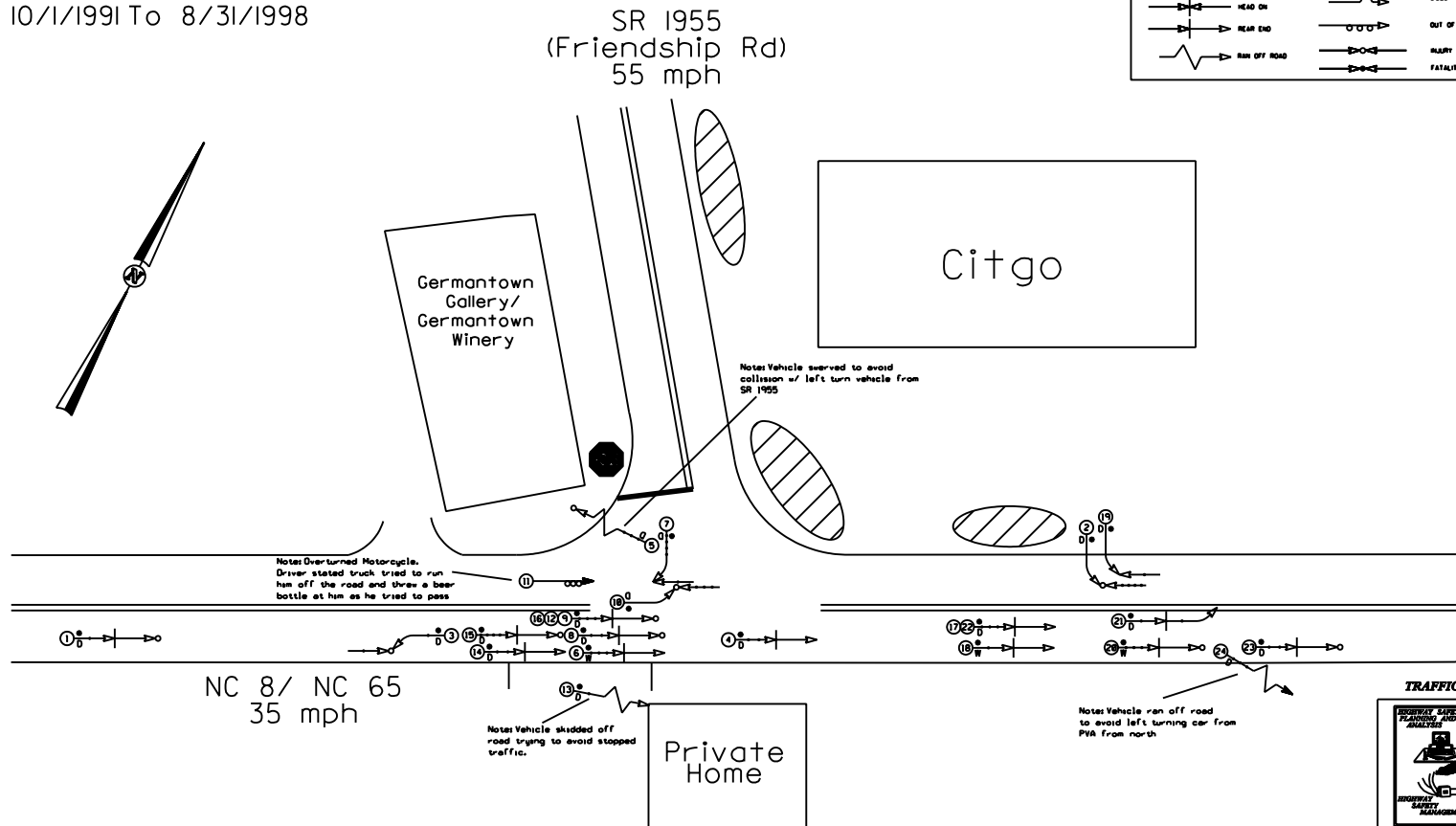
Traveling South on SR 1955 (Friendship Rd)

Stokes County

NC 8/ NC 65 at SR 1955 (Friendship Rd)

Treatment Site in The Before Period

From 10/1/1991 To 8/31/1998



LEGEND

	MOVING VEHICLE		ANGLE		9 MPH OR LESS		P PEDESTRIAN
	PEDESTRIAN		TURNING		10 MPH TO 19		T TRAIN
	PAKED VEHICLE		BACKING		20 MPH TO 29		D DRIVER AT FAULT
	PAKED VEHICLE		BACKING		30 MPH TO 39		D DRY
	FIXED OBJECT		SKIDMARK		40 MPH TO 49		W WET
	HEAD ON		OUT OF CONTROL		50 MPH TO 59		I ICE OR SNOW
	REAR END		HALT		60 MPH TO 69		F FATALITY
	RAN OFF ROAD		FATALITY		70 AND UP		S SPEED UNKNOWN

TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT



COLLISION DIAGRAM	
DIVISION 9	AREA
STUDY PERIOD: 10/1/99-8/31/99	
DISTANCE: 1/4 MI. + 1/4 MI.	
ANALYSIS PREPARED BY: B. Robinson	
ANALYSIS CHECKED BY:	
DIAGRAM PREPARED BY: B. Robinson	
DIAGRAM REVIEWED BY:	
SCALE:	NOT TO SCALE
DATE: April 2006	
LOG NUMBER: 2005027	

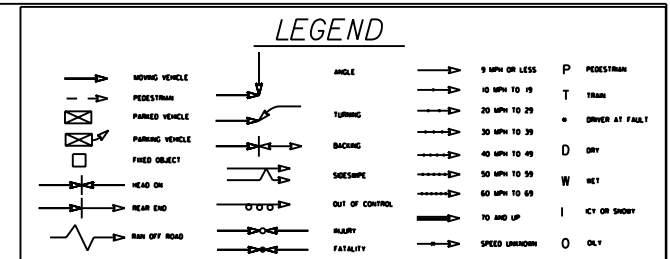
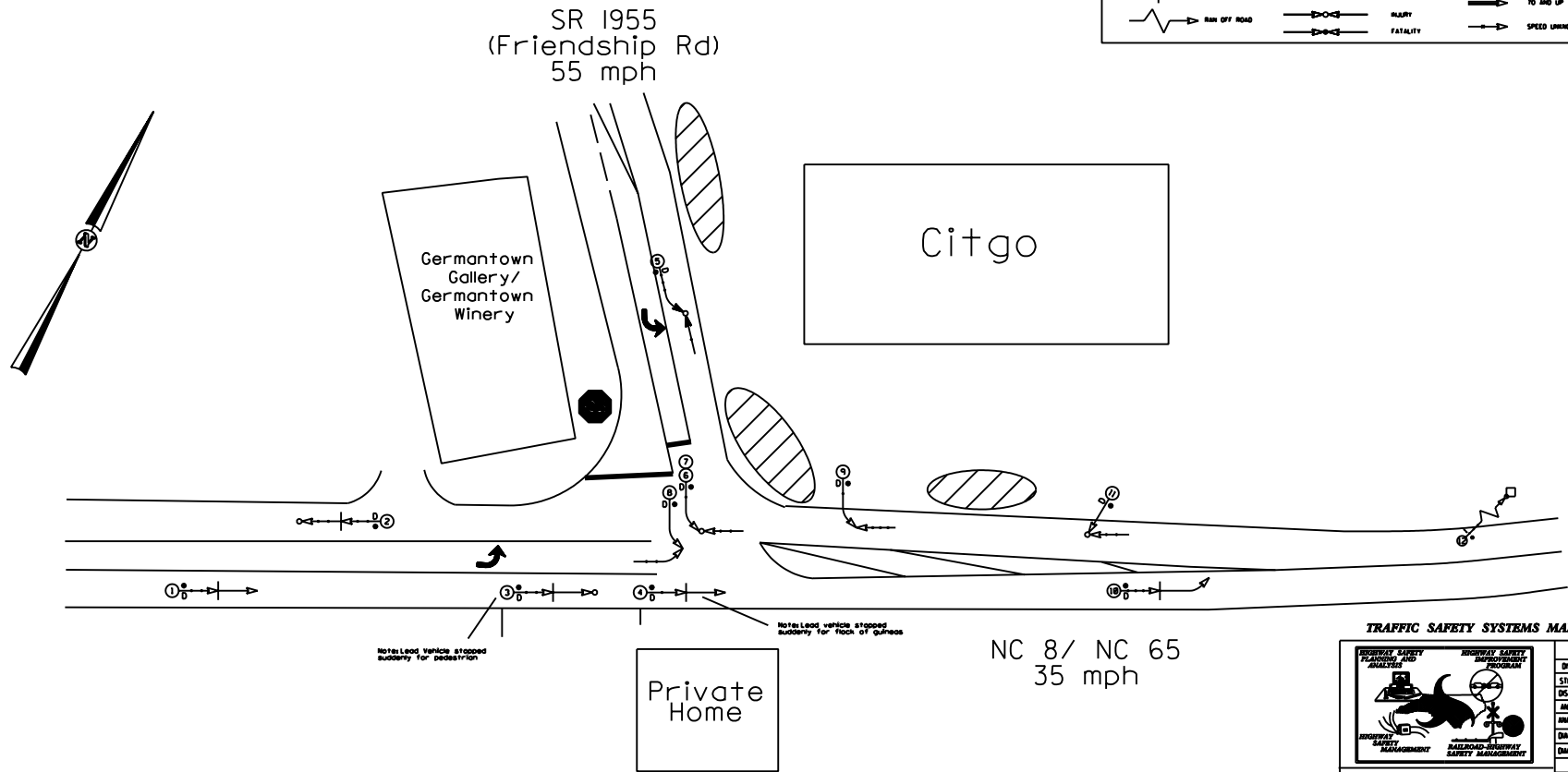
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DIVISION of HIGHWAYS
TRAFFIC ENGINEERING AND SAFETY
SYSTEMS BRANCH

Stokes County

NC 8/ NC 65 at SR 1955 (Friendship Rd)

Treatment Site in The After Period

From 2/1/1999 To 12/31/2005



TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT



COLLISION DIAGRAM	
DIVISION 9	AREA
STUDY PERIOD: 2/1/1999-12/31/2005	
DISTANCE: 1/4 MI. + 1/4 MI.	
ANALYSIS PREPARED BY: B. Robinson	
ANALYSIS CHECKED BY:	
DIAGRAM PREPARED BY: B. Robinson	
DIAGRAM REVIEWED BY:	
SCALE:	NOT TO SCALE
DATE: April 2006	
LOG NUMBER: 20050201	

N.C. DEPARTMENT of TRANSPORTATION
DIVISION of HIGHWAYS
TRAFFIC ENGINEERING AND SAFETY
SYSTEMS BRANCH